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ABSTRACT

As indicated by multiple measures (including overt criminal behavior), stability of aggressive behavior was investigated across 22 years for males and females in a variety of situations. Originally, subjects included the entire population enrolled in the third grade in a semi-rural county in New York State. The sample included approximately 870 youngsters whose modal age at the time was 8 years. Interviews were conducted with 80 percent of the subjects' parents. Ten years later, 427 of the original subjects (modal age 19) were interviewed again. In 1981, 295 of the original subjects were interviewed in person, and another 114 were interviewed by mail. Additional data about these and other subjects in the original sample were obtained from the New York State Division of Criminal Justice Services and the Division of Motor Vehicles. Interviews were conducted with the spouses of 165 subjects and 82 of the subjects' own children. To derive the measure of stability in aggression across the 22-year period, a structural model involving manifest variables and a latent "aggression" variable was developed. Based on correlation and regression analyses, results indicate (1) moderately good predictability from early to later aggression over 22 years, especially among males; (2) a relationship at 8 years between intelligence quotient and aggression that is not found later; (3) intergenerational transmission of aggression; and (4) stability of aggression as a characteristic of the individual. (RH)

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Stability of Aggressive Behavior[1]

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In a review of 16 separate studies, Olweus (1979) has documented the stability of aggressive behavior over time in male subjects. The research to be reported here adds to that body of literature with a study demonstrating stability of aggressive behavior over 22 years for both males and females in a variety of situations as indicated by multiple measures including overt criminal behavior.

The subjects originally comprised the entire population of youngsters enrolled in the third grade in a semi rural county in New York State. This included approximately 870 youngsters whose modal age at the time was eight years. In addition to seeing those subjects at school, we also interviewed 80% of their mothers and fathers. Ten years later, we reinterviewed 427 of the original subjects (modal age, 19). One of the most impressive findings was the stability of aggressive behavior over time and across situations using a variety of measurement operations (Lefkowitz, Eron, Walder and Huesmann, 1977).

In 1981, we again interviewed 295 of the original subjects individually and another 114 by mail (modal age, 30). In addition, we obtained data from the New York State Division of Criminal Justice Services, and the Division of Motor Vehicles about these subjects as well as 223 other subjects who were in the original group, but whom we did not see for follow-up interviews primarily because they were unavailable. We also were successful in obtaining interviews with the spouses of 165 subjects, and 82 of the subjects' own children who at the time were approximately the same age as the subjects when first seen. Thus, there are data from three generations of informants - the subjects, their parents and their children.

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Early Measures

Child aggression in 1960 was measured by a peer nomination technique (Walder, Abelson, Eron, Banta & Laulicht, 1961). In this procedure, every child in a class rated every other child on a series of 10 specific items of aggressive behavior. The child's aggression score was the percentage of times he was nominated by his peers on the 10 items out of the total number of times he could have been nominated. The reliability and validity of this measure have been extensively documented (Eron, et al., 1972; Lefkowitz, et al., 1977; Eron, Huesmann, Brice, Fischer and Mermelstein, 1983).

Later Measures

Indications of the subjects' aggression 22 years later at age 30 were derived from self-ratings, ratings of the subject by the spouse and citations of offenses by the New York State Divisions of Criminal Justice and Traffic. Self-ratings included the sum of MMPI scales F, 4 and 9 which previous research (Huesmann, Lefkowitz and Eron, 1978) has indicated is a reliable and valid measure of overt aggression. Ratings by the spouse of the subject's aggression included behavior directed toward him or her by the subject. The items came from the Strauss Home Violence Questionnaire (1979). The Criminal Justice scores were the total number of convictions in New York State in the previous 10 years and a rating of the seriousness of the corresponding offenses. The latter is a system used by the New York State Criminal Justice Division in which each type of offense is assigned a specific seriousness score (Rossi, Bose and Berk, 1974).* For those subjects who had children, there were also ratings of how severely the subject punished the child as well as self-ratings of aggression by the child. We will also be referring to another punishment

*Also included as criterion behaviors were the total number of moving violations in the previous 10 years and the number of convictions for driving while impaired.

score reflecting how severely the subjects themselves were punished by their own parents, when they were 8 years old, as told to us by the parents.

Procedure

Subjects were contacted by mail and telephone. Addresses were obtained from local directories, a network of informants, newspaper stories and newspaper advertisements. Subjects were paid $40.00 for an interview lasting one to two hours. The interview was administered in our field office on a micro computer. The questions were displayed on a TV type monitor and answered by the respondent typing into the computer keyboard. With this procedure, the subjects' responses were immediately punched into the computer and stored on floppy disks which were then read by more powerful computers. This was an efficient, time saving, relatively error-free procedure. Respondents learned the procedure quickly, enjoyed the novelty and were reassured of the confidentiality of their responses. It is very likely that using the computerized interview added to the validity of the information obtained.

At the close of the interview, the subjects was asked for permission to contact the spouse for an interview, and if the subject had a child age 6 to 12, permission was sought to interview that child, or the oldest such child, if there were more than one. Spouses were also paid $40.00 per interview and children were paid $20.00. Those subjects who were unable to come to the field office for interviews were asked to fill out a mail questionnaire and were paid $40.00 if it was sent back within two weeks. Certain of the measures which required personal interaction, the WRAT for example, were eliminated for the postal sample. However, for those measures which could

be obtained through the mail, the results were merged with those obtained in the regular procedure. This accounts for the differences in the number of subjects per procedure. Spouses and children were not interviewed by mail.

Results

The effect of attrition over 22 years on the composition of the sample was evaluated by examining the mean 1960 peer-nominated aggression scores for those subjects who were interviewed either personally or by mail with those who were not interviewed at all in 1981. Male subjects who were not interviewed in 1981 had a significantly higher mean aggression score in 1960 than those male subjects who were interviewed. However, there was no difference between the personal and postal interview groups. As for the female subjects, there were no significant differences in 1960 aggression score among any of the groups, whether interviewed by mail or in person. Male subjects of course had significantly higher aggression scores than females in each group.

Correlations between the early and later measures of aggression are shown in Table 1. It is apparent that over 22 years there is still moderately good predictability from early aggression to later aggression, especially in the case of males. Also in this table are the correlations between an early IQ measure, the California Test of Mental Maturity, and the Spelling, Reading and Arithmetic scores of the WRAT 22 years later. While the stabilities are not as high for aggression as they are for intellectual competence, they are still respectable and hold up across method, informant and situation as well as time. Especially impressive is the correlation between aggression at age 8 and later encounters with the law as indicated by driving and criminal offenses.

Since a disproportionate number of the original subjects who moved out of the state subsequent to the original testing were from high aggressive groups (Lefkowtiz, et al., 1977), the range of aggression scores has been truncated and the correlations are probably a minimal estimate of the relation between aggression at age 8 and later anti-social behavior of the type that brings individuals into contact with the law. Further, as we mentioned before, the 1960 aggression score of males not interviewed was significantly hgiher than the aggression score of those males who were interviewed.

Another reason why the Pearson r may be an under estimation of the true relation between variables presented here is that the distributions of many of the measures are skewed (e.g., peer-nominated aggression has a pile up of scores at the low end of the scale). A more representative demonstration of the relations can be obtained by dividing the subjects into low, medium and high groups according to the original peer-nomination measure and calculating mean scores on each of the criterion variables separately for each of the three groups. These relations are seen much more graphically in Figure 1, 2, 3 & 4. Figure 1 shows the relation between early peer-rated aggression and a self-rating of aggression 22 years later; figure 2 refers to another self disclosure measure, how severely the subject punishes his or her own child 22 years later. Figure 3 demonstrates the relation on the left between peer-rated aggression of boys at age 8 and how aggressive they were towards their wives, as rated by their wives, when they are age 30. On the right is the relation of the number of criminal convictions in the past 10 years to peer rated aggression at age 8. And finally, in figure 4, we have the relation to moving traffic violations and convictions for driving while impaired. When tested by analysis of variance, the differences among the means on each of the criterion variables are highly significant, again especially in the case of males.

There are more significant predictions from 1960 aggression to 1981 aggression for males than for females (7 vs. 2), as was seen in Table 1. It is interesting that the one aggression area at the later period which is predicted successfully for females from both early aggression and early IQ is punishment of the subject's child. Child punishment is probably the only arena in which a female can express aggression without fear of social censure or retaliation. In the other arenas, aggression toward spouse, criminal offenses, and moving traffic violations, there is such a low frequency for females that successful prediction from earlier indications of aggression is very unlikely.

Since, as has been demonstrated previously (Lefkowitz et al., 1977) aggression is significantly related to IQ, it is fair to ask how much of the stability of aggression results from its correlation with intelligence. In this particular sample, IQ and aggression at age eight were moderately correlated negatively (-.27 for boys and -.32 for girls). The relative contribution of earlier aggression and IQ to later aggression, however, can be evaluated more precisely by multiple regression analysis. A number of multiple regressions were done where both early aggression and early intellectual competence were related to 1981 aggression criteria. For example, as indicated in Table 2, in predicting to MMPI aggression score, the standardized coefficient for IQ was non-significant; so IQ has little to do with that relation. Similarly, in predicting to criminal justice convictions, the standardized regression coefficient for aggression was significant while the standardized coefficient for IQ was non-significant. In predicting to driving while intoxicated, the standardized coefficient for aggression was significant and for IQ non-significant. The same pattern is present in the other four aggression measures. Thus, although IQ and aggression <u>are</u> related at age eight,

the relation of early aggression to later aggression is independent of the relation between IQ and aggression. Whatever effect IQ has on aggression, it has already taken place before age eight because subsequent change in aggression is no longer affected by IQ to any appreciable extent.

Intergenerational Effects

Our data, collected over three generations, indicate that aggression, as a characteristic behavior, is transmitted from parent to child. It should be noted that genetic transmission is not necessarily implied here. Over and above whatever equipment and tendencies the child is born with there are many ways in which parents can teach children aggression and we have reviewed these ways before. Now we are interested in examining the total effect of these learning interactions across generations. In 1960, there was a relation between how aggressive these subjects were in school, as nominated by their peers, and how severely they were punished for aggression by their parents at home (.23 $p < .0001$). When the subjects were 19 years of age, they were asked to imagine how they would respond to their child's aggression if they had an eight-year-old child. The correlation was .24 between their peer-nominated aggression score in 1960 and their hypothetical response in 1970; and .31 between their hypothetical response in 1970 and their own parents' actual responses in 1960 (Lefkowitz, et al., 1977). In 1981, those subjects who now had children between 6 and 12 years were asked the same questions and the correlation between their earlier peer-nominated aggression and how severely they reported punishing their own child for aggression was similar (.24). Furthermore, the subjects' peer-nominated aggression score obtained in 1960 correlated with their own childrens' self-rated aggression in 1981 moderately high (.34). This is especially interesting since the self-rating items used

for the subjects' children were the same 10 items which comprised the peer nominations on which the subjects were rated by their peers 20 years earlier. Further, the subjects' 1960 aggression score is correlated even more highly (.44) with the extent to which the subjects' own children tend to fantasize about aggression.

The degree of stability in aggressive behavior demonstrated here over 22 years on a multiplicity of criterion measures reaching back as well to a previous generation and ahead to a future one, is indeed impressive. However, since different measures of aggression were utilized in the initial and final waves of the study, we do not have a pure stability coefficient. The criterion measures and the predictor measures are not similar. One way to surmount this problem is by estimating coefficients of a structural model involving a latent variable representing the "trait" of aggression. A simple example of such a model is shown in Figure 5. The latent variables are denoted by round nodes and the manifest variables by square nodes. In this example, only the manifest variables of "peer-nominated aggression" and "sum of MMPI F, 4 & 9" are used because they had been selected as the primary measures of aggression on apriori grounds.

The model is identified (it yields 10 equations for the 10 parameters). The blank circles represent all determinants of the measured variables other than aggression and random error.

The parameters of the revised model were estimated with the LISREL computer program. To compute the 22-year stability of the hypothesized latent trait of aggression, one must multiply the coefficients which represent stabilities over shorter periods. In this way, one derives a 22-year stability of .44 which is substantially higher than the observed correlation from Age 8 peer-nominations to Age 30 MMPI F+4+9 (. 0).

However, there can be little doubt that aggression is a stable characteristic of the individual. We have presented findings which indicate that the best predictor of later aggression (up to 22 years later) is early aggression. Of course this does not mean that the behavior is fixed at an early age and cannot be changed. But we must start early in the lives of developing youngsters. By the time a child is eight-years-old, characteristics ways of behaving aggressively or non-aggressively have already been set down. Aggression, as a problem-solving behavior, is learned very early in life, and it is learned very well; the payoff is excellent. The inducement to change must be made equally attractive.

Table 1
Correlations of Peer-nominated Aggression and IQ at Age 8
with Aggression and IQ Age 30

Age 30 Measures	Age 8 Aggression		Age 8 IQ	
	Males	Females	Males	Females
Aggression Measures:				
MMPI Scales F + 4 + 9	.30***	.16*	-.19**	——
Rating of Subject by Spouse	.27**	——	——	——
Punishment of Child by Subject	.24*	.24*	——	-.21*
Criminal Justice Convictions	.24***	——	-.15**	——
Seriousness of Criminal Offense	.21***	——	-.14*	——
Moving Traffic Violations	.21***	——	——	——
Driving While Intoxicated	.29***	——	——	——
IQ Measures:				
WRAT Spelling	-.30***	-.35***	.54***	.44***
WRAT Reading	-.20*	-.37***	.56***	.47***
WRAT Arithmetic	-.19*	-.35***	.55***	.42***

Table 2
Regression of Age 8 Aggression and IQ Scores
on Age 30 Aggression Measures

Age 30 Measures	Standardization Coefficients			
	Males		Females	
	Aggression	IQ	Aggression	IQ
MMPI Scales F+4+9	.27***	NS	.16*	NS
Rating of Subject by Spouse	.26*	NS		
Punishment of Child by Subject	.25*	NS	.19*	NS
Criminal Justice Convictions	.22***	NS		
Seriousness of Criminal Offenses	.19***	NS		
Moving Traffic Violations	.17***	NS		
Driving While Intoxicated	.31***	NS		

*** $p < .001$

** $p. < .01$

* $p < .05$

FIGURE 1

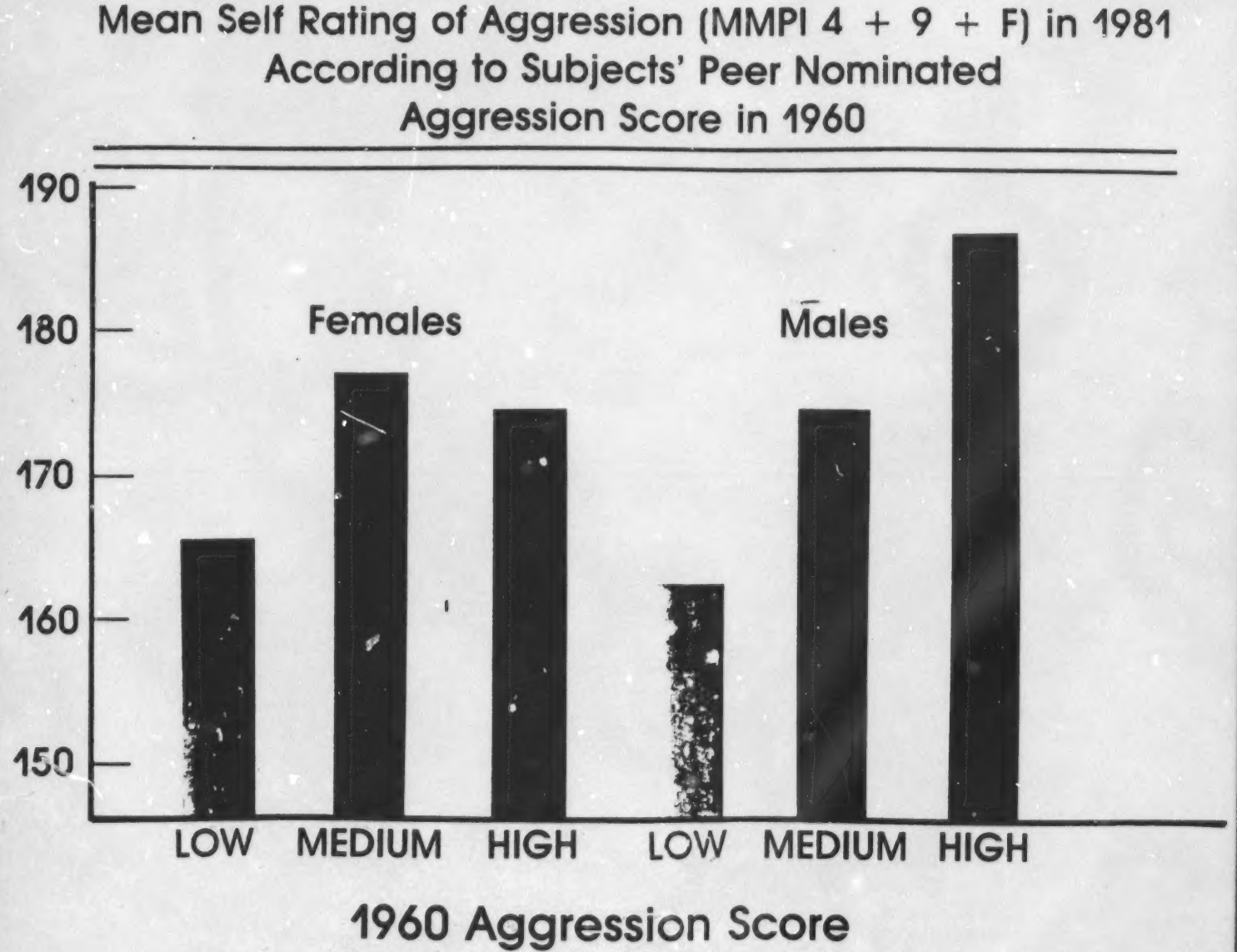

Mean Self Rating of Aggression (MMPI 4 + 9 + F) in 1981
According to Subjects' Peer Nominated
Aggression Score in 1960
190
180
170
160
150
Females
Males
LOW
MEDIUM
HIGH
LOW
MEDIUM
HIGH
1960 Aggression Score

FIGURE 2

Mean Punishment of Child Scores in 1981 According to Subjects' Aggression Score in 1960

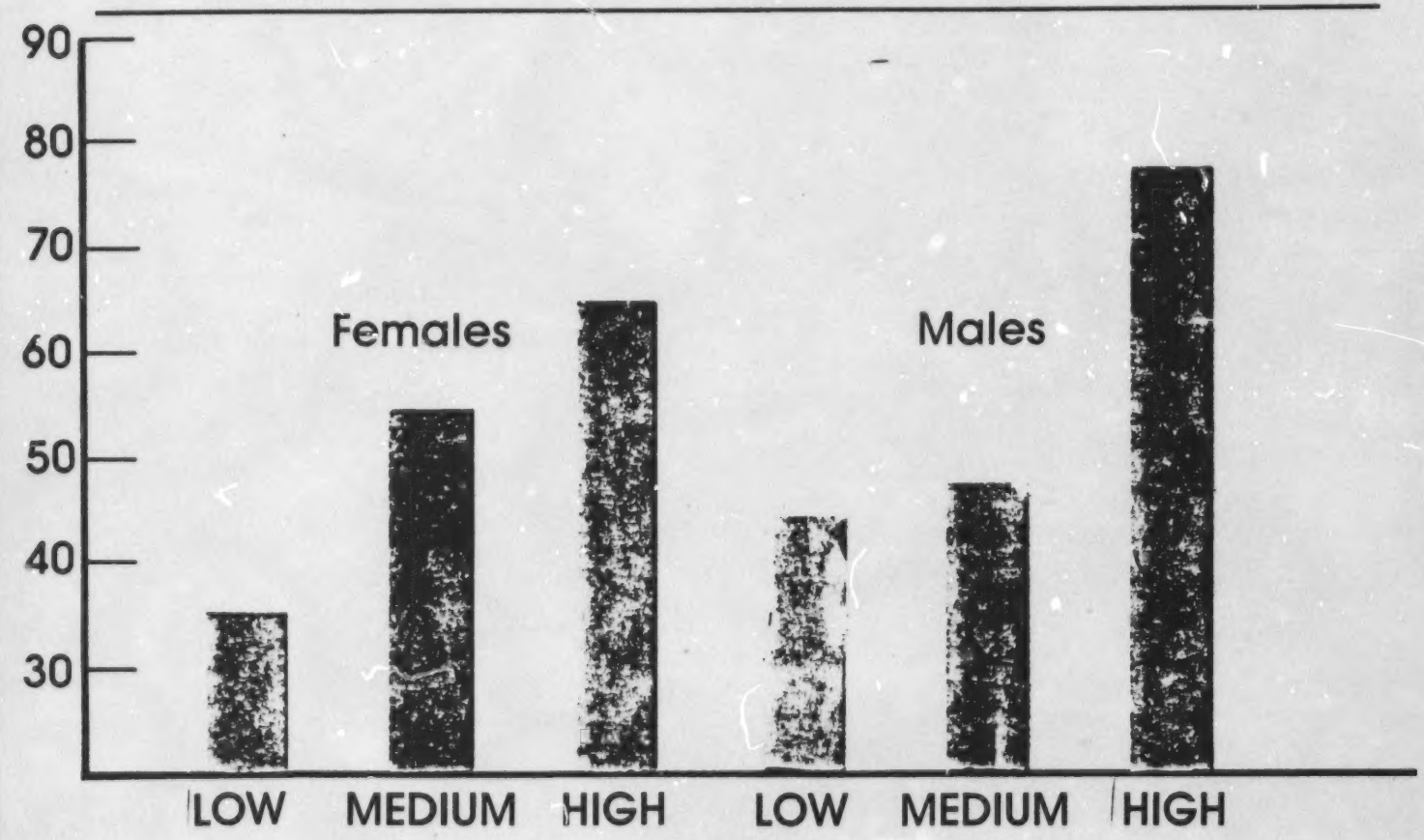


FIGURE 3

Aggression Scores of Male Subjects in 1981 According to Aggression Scores in 1960

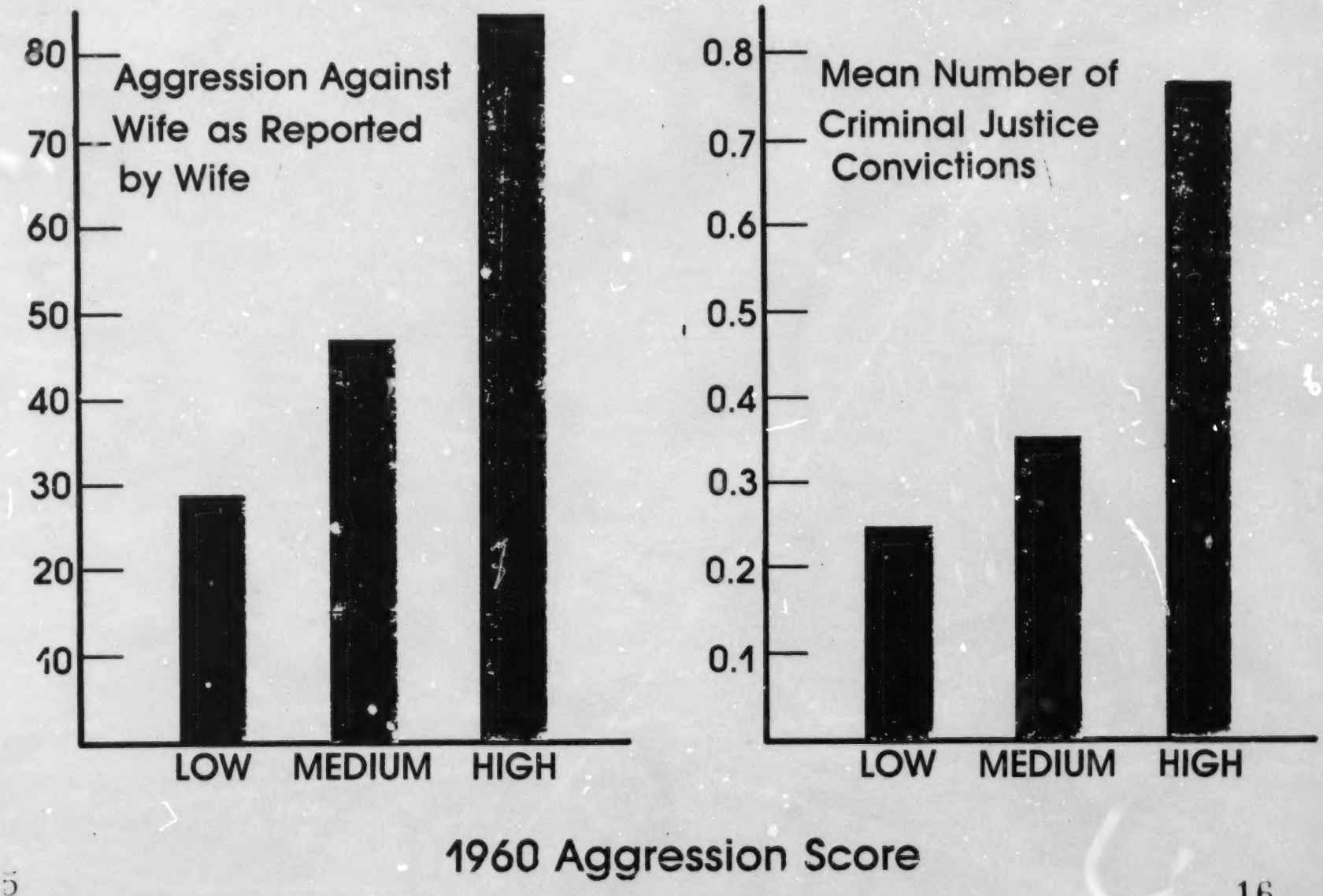


FIGURE 4

Mean Number of Traffic Violations in New York State Until 1981 According to Male Subjects' Aggression Score in 1960

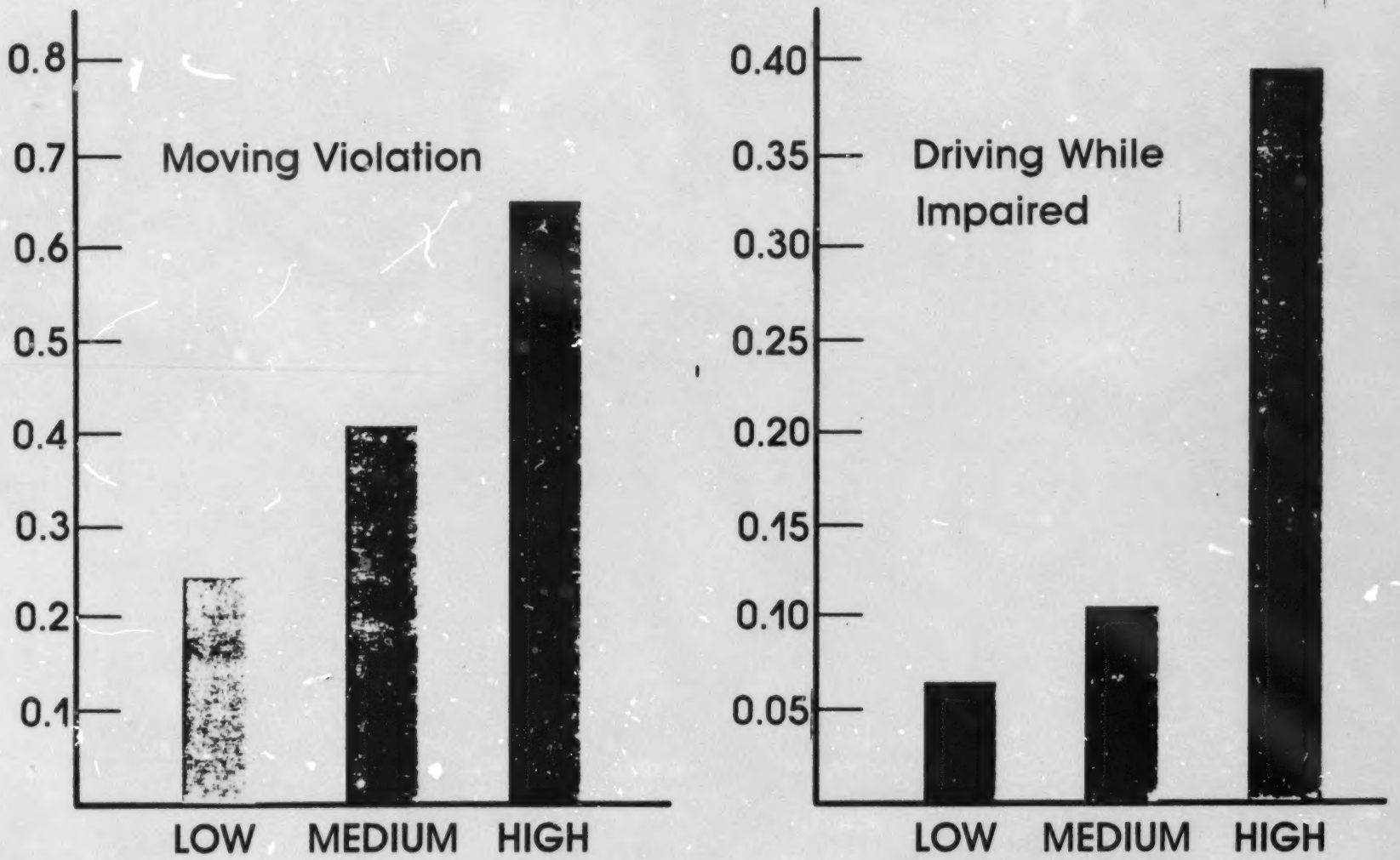
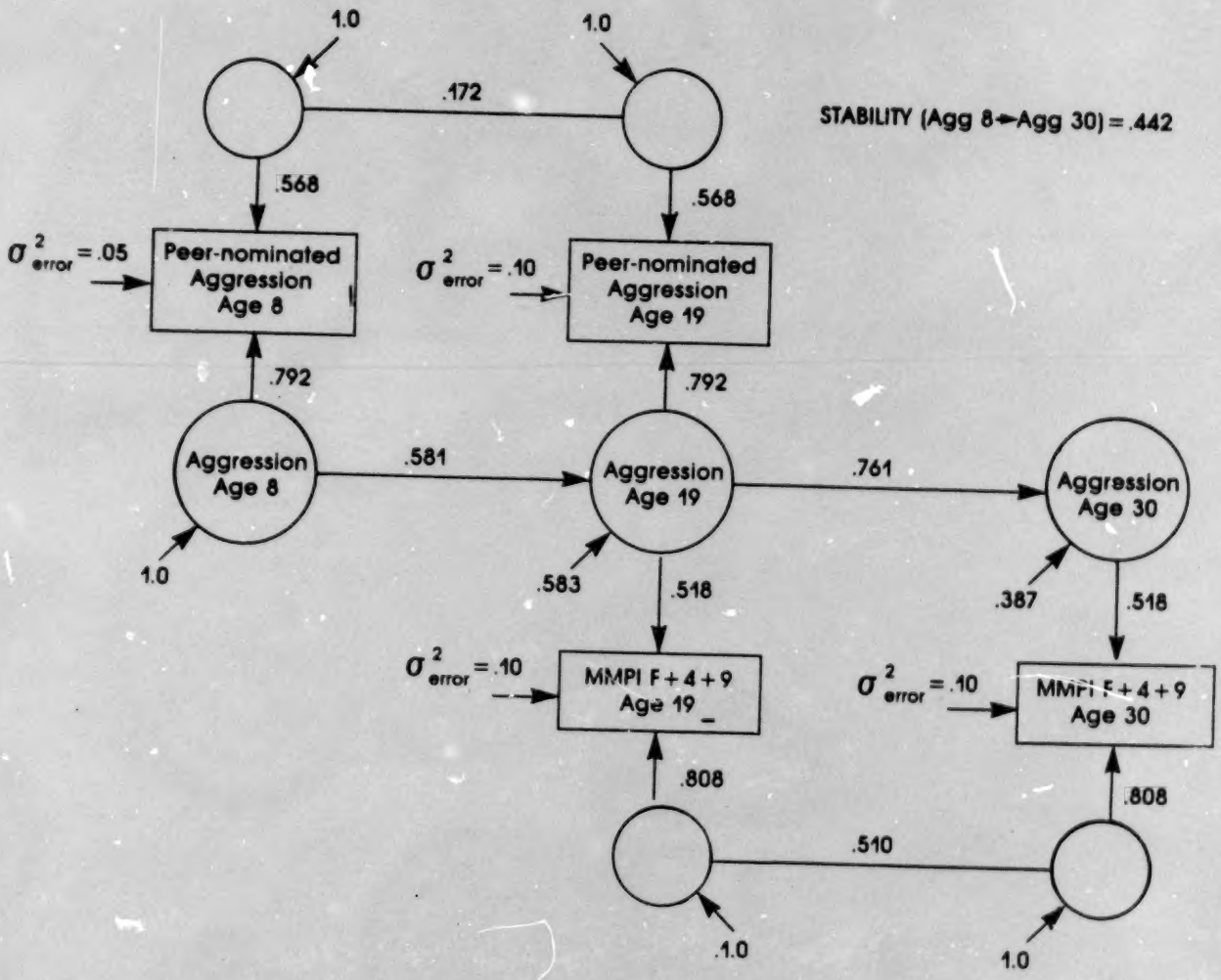


FIGURE 5


1.0
1.0
.172
STABILITY (Agg 8←Agg 30) = .442
.568
.568
σ^2_{error} = .05
Peer-nominated Aggression Age 8
σ^2_{error} = .10
Peer-nominated Aggression Age 19
.792
.792
Aggression Age 8
.581
Aggression Age 19
.761
Aggression Age 30
1.0
.583
.518
.387
.518
σ^2_{error} = .10
MMPI F+4+9 Age 19
σ^2_{error} = .10
MMPI F+4+9 Age 30
.808
.808
.510
.1.0
1.0